

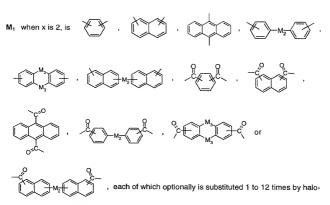
- 1. Alkaline developable, photosensitive composition comprising
- (A) at least one alkaline soluble binder resin, prepolymer or monomer component;
- (B) at least one compound of formula I or II

 $R_1~$ is $C_4\text{-}C_9\text{cycloalkanoyl},\,C_3\text{-}C_{12}\text{alkenoyl};\,C_1\text{-}C_{20}\text{alkanoyl}$ which is unsubstituted or substituted by one or more halogen, CN or phenyl; or R_1 is benzoyl which is unsubstituted or substituted by one or more $C_1\text{-}C_6\text{alkyl}$, halogen, CN, OR $_3$, SR $_4$ or NR $_6R_6$; or R_1 is $C_2\text{-}$ $C_{12}\text{alkoxycarbonyl}$ or benzyloxycarbonyl; or phenoxycarbonyl which is unsubstituted or substituted by one or more $C_1\text{-}C_6\text{alkyl}$ or halogen;

Ar₁ is C_6 - C_{20} aryl or C_6 - C_{20} aryloyl, both radicals are unsubstituted or substituted 1 to 12 times by halogen, C_1 - C_{20} alkyl, benzyl, C_1 - C_{20} alkanoyl, C_3 - C_6 cycloalkyl; or said C_6 - C_{20} aryl or C_6 - C_{20} aryloyl is substituted by phenyl or benzoyl each of which optionally is substituted by one or more OR_3 , SR_4 or NR_5R_6 ; or said C_6 - C_{20} aryl or C_6 - C_{20} aryloyl is substituted by C_2 - C_{12} alkoxycarbonyl optionally interrupted by one or more -O- and/or optionally substituted by one or more hydroxyl groups; or said C_6 - C_{20} aryl or C_6 - C_{20} aryloyl is substituted by phenoxycarbonyl, OR_3 , SR_4 , SOR_4 , SO_2R_4 or NR_5R_6 , wherein the substituents OR_3 , SR_4 or NR_5R_6 optionally form 5- or 6-membered rings via the radicals R_3 , R_4 , R_5 and/or R_6 with further substituents on the aryl ring of the C_6 - C_{20} aryl or C_6 - C_{20} aryloyl group or with one of the carbon atoms of the aryl ring of the C_6 - C_{20} aryl or C_6 - C_{20} aryloyl group;

or Ar₁ is C_3 -C₉heteroaryl, provided that R₁ is acetyl, said C_3 -C₉heteroaryl is unsubstituted or substituted 1 to 7 times by halogen, C_1 -C₂₀alkyl, benzyl, C_1 -C₂₀alkanoyl, or C_3 -C₈cycloalkyl; or said C_3 -C₉heteroaryl is substituted by phenyl or benzoyl, each of which optionally is substituted by one or more OR₃, SR₄ or NR₆R₆; or said C_3 -C₉heteroaryl is substituted by C₂-C₁₂alkoxycarbonyl optionally interrupted by one or more -O- and/or optionally substituted by one or more hydroxyl groups; or said C_6 -C₂₀aryl or C_6 -C₂₀aryloyl is substituted by phenoxycarbonyl, OR₃, SR₄, SOR₄, SO₂R₄ or NR₆R₆;

x is 2 or 3:



gen, C_1 - C_{12} alkyl, C_3 - C_8 cycloalkyl, benzyl; phenyl which is unsubstituted or substituted by one or more OR_3 , SR_4 or NR_5R_6 ; benzoyl which is unsubstituted or substituted by one or more OR_3 , SR_4 or NR_5R_6 ; C_1 - C_{12} alkanoyl; C_2 - C_{12} alkoxycarbonyl optionally interrupted by one or more OP- and/or optionally substituted by one or more OP- and/or optionally substituted by one or more OP-, phenoxycarbonyl, OR_3 , SR_4 , SOR_4 , SO_2R_4 or NR_5R_6 ;

is substituted 1 to 12 times by halogen, C_1 - C_{12} alkyl, C_3 - C_8 cycloalkyl; phenyl which is unsubstituted or substituted by one or more OR_3 , SR_4 or NR_5R_6 ; benzyl, benzoyl, C_1 - C_{12} alkanoyl; C_2 - C_{12} alkoxycarbonyl optionally interrupted by one or more -O- and/or optionally substituted by one or more hydroxyl groups, phenoxycarbonyl, OR_3 , SR_4 , SOR_4 , SO_2R_4 or NR_5R_6 ;

 $\mathbf{M_2}$ is a direct bond, -O-, -S-, -SS-, -NR₃-, -(CO)-, C_1 - C_{12} alkylene, cyclohexylene, phenylene, naphthylene, -(CO)O-(C_2 - C_1 -alkylene)-O(CO)-, -(CO)O-(CH₂CH₂O)_n-(CO)- or -(CO)-



(C2-C12-alkylene)-(CO)-; or M2 is C4-C12alkylene or C4-C12alkylenedioxy-, each of which is optionally interrupted by 1 to 5 -O-, -S- and/or -NR3-;

M₃ is a direct bond, -CH₂-, -O-, -S-, -SS-, -NR₃- or -(CO)-;

$$M_4$$
 is $\stackrel{N}{\longrightarrow}$, $\stackrel{N}{\longrightarrow}$ or $\stackrel{}{\longrightarrow}$;

 R_3 is hydrogen or C_1 - C_{20} alkyl; or R_3 is C_2 - C_{12} alkyl which is substituted by -OH, -SH, -CN, phenyl, -(CO)OH, -(CO)O(C₁-C₄alkyl), -N(C₁-C₄alkyl)₂, -N(CH₂CH₂OH)₂,

-N[CH₂CH₂O-(CO)-C₁-C₄alkyl]₂ or morpholinyl; or R₃ is C₂-C₁₂alkyl which is interrupted by one or more -O-; or R_3 is -(CH₂CH₂O)_{n+1}H, -(CH₂CH₂O)_n(CO)-C₁-C₈alkyl, C₁-C₈alkanoyl, C₃-C₁₂alkenyl, C₃-C₆alkenoyl, C₃-C₈cycloalkyl; or R₃ is benzoyl which is unsubstituted or substituted by one or more C₁-C₆alkyl, halogen, -OH or C₁-C₄alkoxy; or R₃ is phenyl or naphthyl each of which is unsubstituted or substituted by halogen, -OH, C₁-C₁₂alkyl, C₁-C₁₂alkoxy, phenyl-C₁-C₃-alkoxy, phenoxy, C₁-C₁₂alkylsulfanyl, phenylsulfanyl, -N(C₁-C₁₂alkyl)₂, diphenylamino or -(CO)R₇; or R₃ is phenyl-C₁-C₃alkyl, or Si(C₁-C₆alkyl)_r(phenyl)_{3-r};

- is 0, 1, 2 or 3;
- is 1 to 20:

R₄ is hydrogen, C₁-C₂₀alkyl, C₃-C₁₂alkenyl, C₃-C₈cycloalkyl, phenyl-C₁-C₃alkyl; C₂-C₈alkyl which is substituted by -OH, -SH, -CN, C3-C6alkenoxy, -OCH2CH2CN, -OCH2CH2(CO)O(C1-C4alkyl), -O(CO)-C1-C4alkyl, -O(CO)-phenyl, -(CO)OH or -(CO)O(C1-C4alkyl); or R4 is C2-C₁₂alkyl which is interrupted by one or more -O- or -S-; or R₄ is -(CH₂CH₂O)_{n+1}H, -(CH_2CH_2O)_n(CO)- C_1 - C_8 alkyl, C_2 - C_8 alkanoyl, C_3 - C_{12} alkenyl, C_3 - C_6 alkenoyl; or R_4 is phenyl or naphthyl each of which is unsubstituted or substituted by halogen, C1-C12alkyl, C1-C₁₂alkoxy or -(CO)R₇;

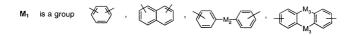
R₅ and R₆ independently of each other are hydrogen, C₁-C₂₀alkyl, C₂-C₄hydroxyalkyl, C₂-C10alkoxyalkyl, C3-C5alkenyl, C3-C8cycloalkyl, phenyl-C1-C3alkyl, C1-C4alkanoyl, C3-C12alkenovl, benzoyl; or are phenyl or naphthyl each of which is unsubstituted or substituted by C1-C12alkyl or C1-C12alkoxy; or R5 and R6 together are C2-C6alkylene optionally interrupted by -O- or -NR3- and/or optionally substituted by hydroxyl, C1-C4alkoxy, C2-C₁alkanovloxy or benzovloxy:

- \mathbf{R}_7 is hydrogen, $C_1\text{-}C_2\text{o}$ alkyl; or is $C_2\text{-}C_8\text{alkyl}$ which is substituted by halogen, phenyl, -OH, -SH, -CN, $C_3\text{-}C_8\text{alkenoxy}$, -OCH $_2\text{CH}_2\text{CN}$, -OCH $_2\text{CH}_2\text{(CO)O}(C_1\text{-}C_4\text{alkyl})$, -O(CO)-C $_1\text{-}C_4\text{alkyl}$, -O(CO)-phenyl, -(CO)OH or -(CO)O(C $_1\text{-}C_4\text{alkyl})$; or \mathbf{R}_7 is $\mathbf{C}_2\text{-}C_{12}\text{alkyl}$ which is interrupted by one or more -O-; or \mathbf{R}_7 is -(CH $_2\text{CH}_2\text{O})_{n+1}\text{H}$, -(CH $_2\text{CH}_2\text{O})_n\text{(CO)-C}_1\text{-}C_8\text{alkyl}$, $C_3\text{-}C_{12}\text{alkeyl}$, cut of the control of the control
- (C) a photopolymerizable compound.
- Photosensitive composition according to claim 1, wherein compound (A) is an oligomeric or polymeric compound.
- Photosensitive composition according to claim 2, wherein the photopolymerizable compound (C) is a liquid.
- 4. Photosensitive composition according to claim 1, wherein component (B) is a compound of formula I or II, wherein
- R_1 is C_2 - C_6 alkanoyl or C_2 - C_6 alkoxycarbonyl; or R_1 is benzoyl which is unsubstituted or substituted by one or more C_1 - C_6 alkyl or halogen;
- Ar₁ is phenyl or naphthyl,

each of these radicals is unsubstituted or substituted 1 to 5 times by halogen, C_1 - C_2 oalkyl, benzyl or C_1 - C_2 oalkanoyl; or said phenyl or naphthyl is substituted by phenyl or benzoyl, each of which optionally is substituted by one or more OR_3 , SR_4 or NR_6R_6 ; or said phenyl or naphthyl is substituted by C_2 - C_1 2alkoxycarbonyl optionally interrupted by one or more -O-and/or optionally substituted by one or more OH; or said phenyl or naphthyl is substituted by OR_3 , SR_4 or NR_5R_6 , wherein the substituents OR_3 , SR_4 or NR_5R_6 optionally form 5- or 6-membered rings via the radicals R_3 , R_4 , R_5 and/or R_6 with further substituents on the phenyl or naphthyl ring or with one of the carbon atoms of the phenyl or naphthyl ring;

or Ar_1 is furyl, pyrrolyl, thienyl, benzofuranyl, indolyl, benzothiophenyl or pyrridyl, provided that R_1 is acetyl; wherein each of these radicals is unsubstituted or substituted 1 to 4 times by halogen, C_1 - C_2 0alkyl, benzyl, C_3 - C_9 0cycloalkyl, phenyl, C_1 - C_2 0alkanoyl, benzoyl, C_2 - C_1 2alkoxycarbonyl, phenoxycarbonyl, OR_3 , SR_4 , SOR_4 , SO_2R_4 or NR_4R_6 ;

x is 2:



or
$$M_2$$
 , each of which optionally is substituted 1 to 4 times by

halogen, C_1 - C_{12} alkyl, benzyl, OR_3 , SR_4 or NR_5R_6 ; or by phenyl which is unsubstituted or substituted by one or more OR_3 , SR_4 or NR_5R_6 ; or by benzoyl which is unsubstituted or substituted by one or more OR_3 , SR_4 or NR_5R_6 ; or by C_1 - C_{12} alkanoyl; or by C_2 - C_{12} alkoxycarbonyl optionally interrupted by one or more -O- and/or optionally substituted by one or more hydroxyl groups;

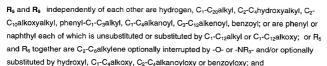
 $\label{eq:mass_section} \begin{tabular}{ll} M_2 & is a direct bond, -O-, -S-, -SS-, -NR_3-, -(CO)-, C_1-C_{12} alkylene, phenylene, -(CO)-(C_2-C_{12} alkylene)-O(CO)-, -(CO)O-(CH_2CH_2O)_n-(CO)- or -(CO)-(C_2-C_{12} alkylene)-(CO)-; or M_2 is $$ C_4-C_{12} alkylene or $C_4-C_{12} alkylene dioxy-, each of which is optionally interrupted by 1 to 5 -O-, -S- and/or -NR_3-; $$ $$ And/o$

M₃ is a direct bond, -CH₂-, -O-, -S-, -NR₃- or -(CO)-;

$$\label{eq:reconstruction} \begin{split} &R_3 & \text{ is hydrogen or } C_1\text{-}C_{20}\text{alkyl}; \text{ or } R_3 \text{ is } C_2\text{-}C_{12}\text{alkyl} \text{ which is substituted by -}OH, -}SH, -O(CO)\text{-}C_1\text{-}C_4\text{alkyl}, -O(CO)\text{-}phenyl, -(CO)\text{O}(C_1\text{-}C_4\text{alkyl}), -N(C_1\text{-}C_4\text{alkyl})_2, -N(CH_2\text{C}H_2\text{O}H)_2, -N(CH_2\text{C}H_2\text{O}-(CO)\text{-}C_1\text{-}C_4\text{alkyl}]_2 \text{ or morpholinyl}; \text{ or } R_3 \text{ is } C_2\text{-}C_{12}\text{alkyl} \text{ which is interrupted by one or more -}O\text{-}; \text{ or } R_3 \text{ is -}(\text{CH}_2\text{C}H_2\text{O})_{n+1}\text{H}, -(\text{C}H_2\text{C}H_2\text{O})_n(\text{CO})\text{-}C_1\text{-}C_6\text{alkyl}, \text{ phenyl-}C_1\text{-}C_3\text{alkyl}, \\ C_2\text{-}C_8\text{alkanoyl}, C_3\text{-}C_{12}\text{alkenyl} \text{ or } C_3\text{-}C_6\text{alkenoyl}; \text{ or } R_3 \text{ is benzoyl which is unsubstituted or substituted by one or more } C_1\text{-}C_6\text{alkyl}, \text{ halogen or } C_1\text{-}C_4\text{alkoxy}; \text{ or } R_3 \text{ is phenyl or naphthyl each of which is unsubstituted or substituted by halogen, } C_1\text{-}C_{12}\text{alkyl}, C_1\text{-}C_{12}\text{alkoxy}, \text{ phenyl-}C_1\text{-}C_3\text{-}alkoxy, phenoxy}, C_1\text{-}C_{12}\text{alkylsulfanyl}, \text{ phenylsulfanyl}, -N(C_1\text{-}C_{12}\text{alkyl})_2, \text{ diphenylamino or -}(\text{CO})R_7;} \end{split}$$

n is 1 to 20:

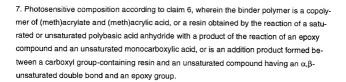
 R_4 is hydrogen, $C_1\text{-}C_{20}\text{alkyl},\,C_3\text{-}C_{12}\text{alkenyl},\,\text{phenyl-}C_1\text{-}C_3\text{alkyl},\,C_2\text{-}C_8\text{alkyl}\,\text{which is substituted by -OH, -SH, -O(CO)-}C_1\text{-}C_4\text{alkyl},\,-O(CO)\text{-phenyl or -(CO)O(C}_1\text{-}C_4\text{alkyl});\,\,\text{or }R_4\text{ is }C_2\text{-}C_{12}\text{alkyl}\,\text{which is interrupted by one or more -O- or -S-; or }R_4\text{ is -}(\text{CH}_2\text{CH}_2\text{O})_{n+1}\text{H},\,-(\text{CH}_2\text{CH}_2\text{O})_n(\text{CO)-}\text{C}_1\text{-}C_8\text{alkyl},\,C_2\text{-}C_8\text{alkanoyl},\,C_3\text{-}C_{12}\text{alkenyl},\,C_3\text{-}C_8\text{alkenoyl};\,\text{or }R_4\text{ is phenyl or naphthyl each of which is unsubstituted or substituted by halogen, $C_1\text{-}C_{12}\text{alkyl},\,C_1\text{-}C_{12}\text{alkoxy} \text{ or -(CO)R}_7;}$



- \mathbf{R}_7 is hydrogen, $C_1\text{-}C_2\text{oalkyl}$; or is $C_2\text{-}C_8\text{alkyl}$ which is substituted by halogen, phenyl, -OH, -SH, $C_3\text{-}C_8\text{alkenoxy}$, -O(CO)- $C_1\text{-}C_4\text{alkyl}$, -O(CO)-phenyl or -(CO)O($C_1\text{-}C_4\text{alkyl}$); or R_7 is $C_2\text{-}C_{12}\text{alkyl}$ which is interrupted by one or more -O-; or R_7 is -(CH $_2\text{CH}_2\text{O})_{n+1}\text{H}$, -(CH $_2\text{CH}_2\text{O})_n(\text{CO})$ -C $_1\text{-}C_8\text{alkyl}$ or $C_3\text{-}C_{12}\text{alkenyl}$; or is phenyl optionally substituted by one or more halogen, $C_1\text{-}C_{12}\text{alkyl}$, $C_1\text{-}C_{12}\text{alkyyl}$, $C_1\text{-}C_{12}\text{alkyl}$, or diphenylamino.
- 5. Photosensitive composition according to claim 1, wherein component (B) is a compound of formula I or II, wherein
- R₁ is C₂-C₄alkanoyl;
- Ar_1 is phenyl or naphthyl, each of which is unsubstituted or substituted by halogen, C_1 - C_9 alkyl, NR_9R_9 or OR_3 , wherein the substituents OR_3 , optionally form 5- or 6-membered rings via the radicals R_3 with further substituents on the phenyl or naphthyl ring; or Ar_1 is 2-furyl, 2-pyrrolyl, 2-thienyl, 3-indolyl, provided that R_1 is acetyl;

 \mathbf{M}_1 is

- x is 2;
- \textbf{R}_3 is $C_1\text{-}C_20\text{alkyl}$; or \textbf{R}_3 is $C_2\text{-}C_{12}\text{alkyl}$ which is substituted by OH, -O(CO)-C $_1\text{-}C_4\text{alkyl}$, -N(C $_1\text{-}C_4\text{alkyl})_2$, -N(CH $_2\text{CH}_2\text{OH})_2$, -N[CH $_2\text{CH}_2\text{O}$ -(CO)-C $_1\text{-}C_4\text{alkyl}$ or morpholinyl; or \textbf{R}_3 is $\textbf{C}_2\text{-}C_{12}\text{alkyl}$ which is interrupted by one or more -O-; or \textbf{R}_3 is -(CH $_2\text{CH}_2\text{O})_{n+1}\text{H}$ or -(CH $_2\text{CH}_2\text{O})_n(\text{CO})\text{-}C}_1\text{-}C_4\text{alkyl}$;
- n is 1 to 3; and
- $\mathbf{R}_{\mathbf{5}}$ and $\mathbf{R}_{\mathbf{6}}$ are $C_{\mathbf{1}}\text{-}C_{\mathbf{4}}$ alkyl.
- Photosensitive composition according to claim 1, wherein the oligomer or polymer (A) is a binder polymer.



- 8. Photosensitive composition according to claim 1, which additionally to the components (A), (B) and (C) comprises at least one photosensitizer compound (D).
- Photosensitive composition according to claim 7, comprising 100 parts by weight of component (A), 0.015 to 120 parts by weight of component (B), 5 to 500 parts by weight of component (C) and 0.015 to 120 parts by weight of component (D).
- 10. Photosensitive composition according to claim 1, comprising further additives (E), which are selected from the group consisting of epoxy compounds, thermal polymerization inhibitors, inorganic fillers, colourants, epoxy curing agents, amines, chain transfer agents, thermal radical initiators, photoreducable dyes, optical brighteners, thickeners, antifoaming agents and leveling agents, in particular inorganic fillers.
- 11. Photosensitive composition according to claim 1, additionally comprising an epoxy compound which contains at least two epoxy groups in the molecule.
- 12. Solder resist comprising a composition according to claim 1.
- 13. Color filter resist comprising a composition according to claim 1.
- 14. Process for the photopolymerization of compounds containing ethylenically unsaturated double bonds, which comprises irradiating a composition according to claim 1 with electromagnetic radiation in the range from 150 to 600 nm.
- 15. Coated substrate which is coated on at least one surface with a composition according to claim 1.

- 16. Process for the production of relief images, wherein a coated substrate according to claim 15 is subjected to imagewise exposure with electromagnetic radiation in the range from 150 to 600 nm, and then the unexposed portions are removed with a solvent.
- 17. A color filter prepared by providing red, green and blue (RGB) color elements and, optionally a black matrix, all comprising a photosensitive composition according to claim 1 and a pigment on a transparent substrate and providing a transparent electrode either on the surface of the substrate or on the surface of the color filter layer.
- 18. Process for forming images, wherein
- (1) the components of a composition according to claim 1 are mixed.
- (2) the resulting composition is applied to the substrate,
- (3) the solvent, if present, is evaporated, at elevated temperature,
- (4) the coated substrate is patternwise exposed to irradiation,
- (5) the irradiated sample is developed with aqueous alkaline solution, thereby removing the uncured areas and
- (6) the sample is thermally cured.